



Product Information

**CompactPCI® Serial • SL4-TUBA**

20-Port Gigabit Ethernet Switch

Document No. 7175 • 18 May 2016



SL4-0100-TUBA

## General

*The SL4-TUBA is a peripheral slot card for CompactPCI® Serial systems. The board is equipped with a modular Gigabit Ethernet switch fabric up to 20 ports. While 5 GbE ports are wired to associated RJ45 front panel jacks, another 14 GbE ports are available for rear I/O via the backplane connectors P5/P6.*

*In addition, the SL4-TUBA is provided with a PCI Express® to Gigabit Ethernet controller, which is internally also connected to the GbE switch.*

For optimum scalability, the SL4-TUBA employs up to four Gigabit Ethernet switches internally, wired together for a total of 20 GbE ports. The Marvell® 88E6350R devices in use are self-managed and comprise a rich feature set.

Likewise, the Intel® I210-IT Ethernet NIC provides latest networking technology, e.g. Audio-Video Bridging (AVB) for tightly controlled media stream synchronisation, buffering, and reservation.



SL4-0100-TUBA

## Feature Summary

- ▶ PICMG® CompactPCI® Serial standard (CPCI-S.0) peripheral slot card
- ▶ Single Size Eurocard 3U 4HP 100x160mm<sup>2</sup>
- ▶ cPCI-S backplane connector P1, P5, P6
- ▶ Suitable for PCIe x 1 standard peripheral slots
  
- ▶ P1 used for PCI Express® lane to I210 Gigabit Ethernet Controller
- ▶ P5, P6 used for up to 14 GbE ports over backplane or rear I/O transition module
- ▶ 5 x RJ45 front panel GbE ports
  
- ▶ Marvell® 88E6350R based Gigabit Ethernet switch fabric (5 x PHY, 2 x RGMII each device)
- ▶ High performance, non-blocking, Gigabit Ethernet
- ▶ Support for up to 1K MAC addresses, 10KByte Jumbo Frames
- ▶ Unmanaged solution
- ▶ Management available on request via Marvell® SOHO Switch GUI Software
- ▶ Up to four 88E6350R devices in use for scalability
  
- ▶ Intel® I210IT Gigabit Ethernet Controller internally wired to GbE switch fabric (20<sup>th</sup> port)
- ▶ 9.5KB Jumbo Frame support
- ▶ Hardware-based time stamping (IEEE 1588) and support for 802.1AS
- ▶ Option IEEE 802.1Qav compliant Audio-Video Bridging (AVB)
- ▶ IPv4, IPv6, TCP/UDP checksum offloads
- ▶ Driver support for all major operating systems
  
- ▶ Designed and manufactured in Germany
- ▶ ISO 9000 certified quality management
- ▶ Long term availability
- ▶ Rugged solution (coating, sealing, underfilling on request)
- ▶ RoHS compliant
- ▶ Commercial and industrial temperature range
- ▶ Humidity 5% ... 95% RH non condensing
- ▶ Altitude -300m ... +3000m
- ▶ Shock 15g 0.33ms, 6g 6ms
- ▶ Vibration 1g 5-2000Hz
- ▶ MTBF 30.2 years
- ▶ EC Regulations EN55022, EN55024, EN60950-1 (UL60950-1/IEC60950-1)



SL4-0200-TUBA

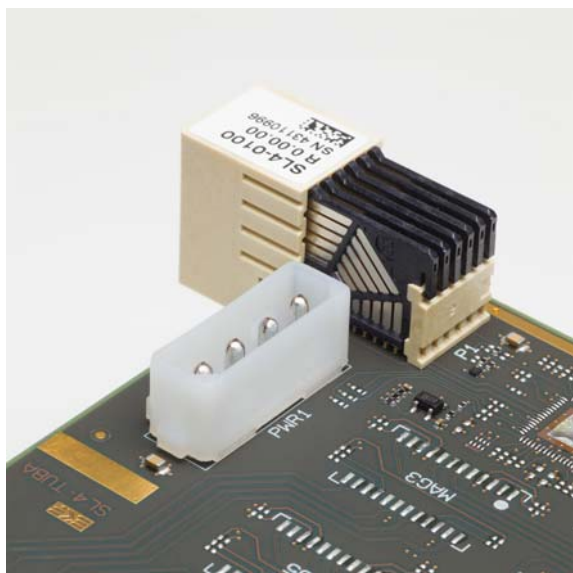


## Theory of Operation

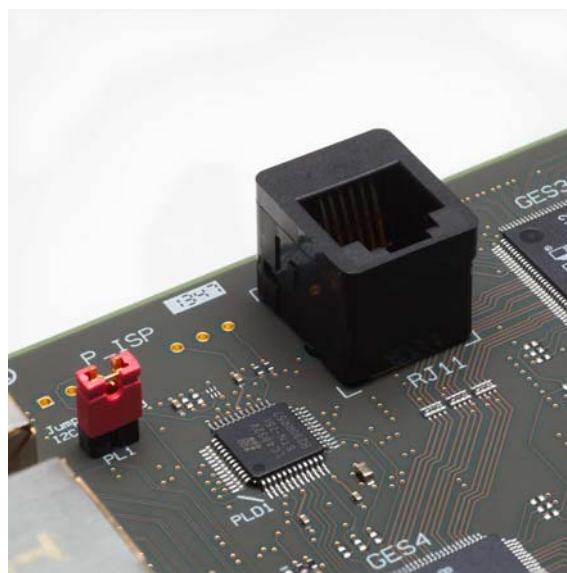
The SL4-TUBA is equipped with a maximum of four Marvell® 88E6350R Gigabit Ethernet switches. Each of them provides 5 ports with integrated Ethernet transceivers (PHY) and two digital interfaces (RGMII). The switches are coupled together by means of their RGMII interfaces. A total of 20 PHY ports is available on-board, wired to the front panel (5) and to the CompactPCI® Serial backplane connectors P5/P6 (14). One PHY port is connected to the on-board Gigabit Ethernet controller.

While the front panel RJ45 jacks are provided with integrated magnetics, all other GbE PHY ports are isolated by on-board magnetics modules. A custom specific backplane will be required for usage of the rear I/O GbE ports.

The SL4-TUBA can be inserted into any CompactPCI® Serial peripheral slot. A single PCI Express® lane would be sufficient for communication with the on-board Gigabit Ethernet controller.



Option Power Connector  
for Standalone Operation

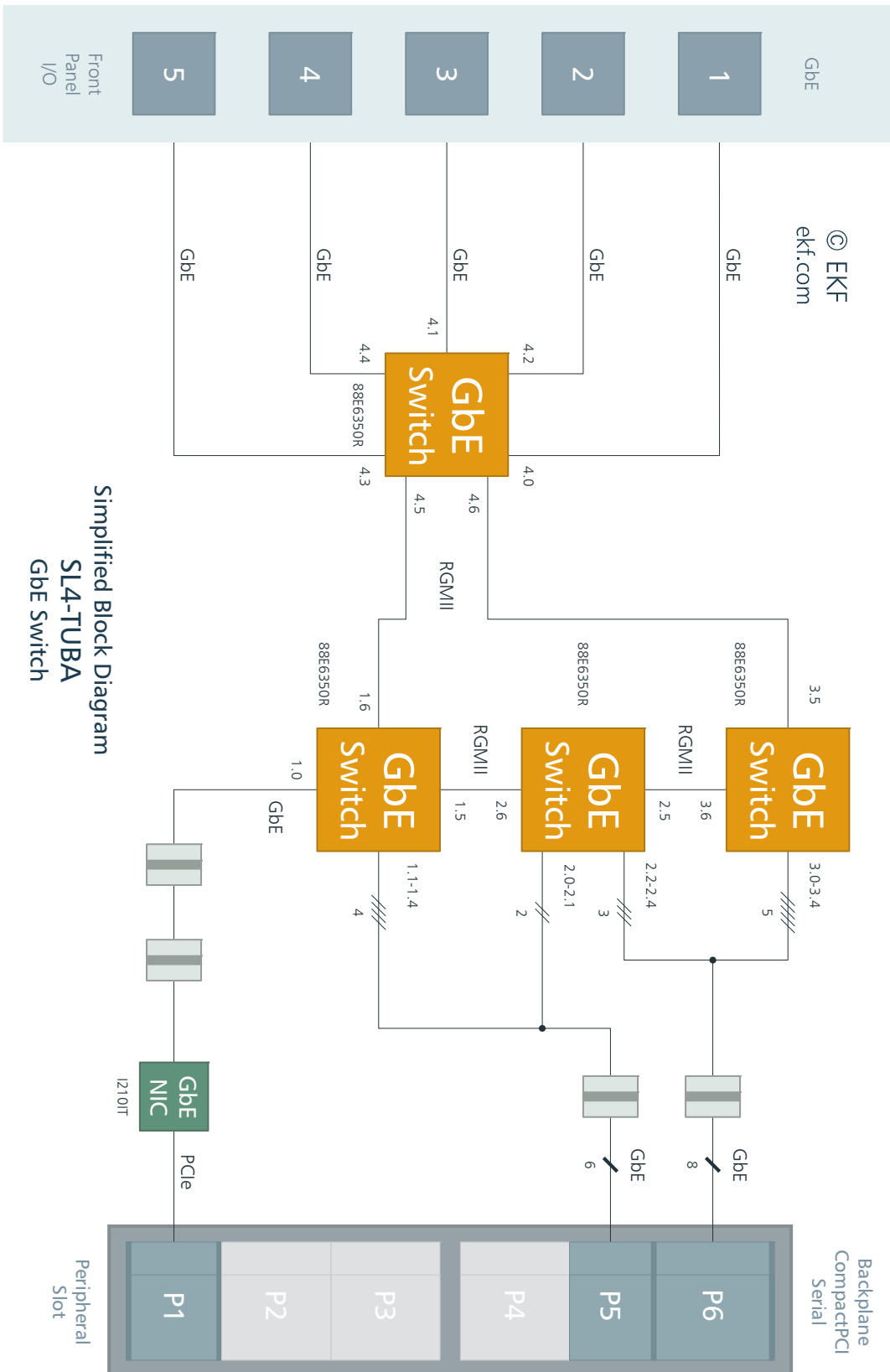


Option Management I/F  
(Marvell NDA Customers Only)

By default, the SL4-TUBA is self-managed. As an option, management is available for front I/O by means of an USB to SMI adapter which connects to the optional on-board MDIO (SMI) interface RJ11 jack. This is the method with the highest level of protection against external attacks.

For convenience, remote management can be done via front panel Ethernet port 4 or 5 (neither activated for management by default). The Marvell® SOHO Switch GUI (Windows®) is required for either method of management. Please contact [support@ekf.de](mailto:support@ekf.de) for details.

### Block Diagram



Simplified Block Diagram  
SL4-TUBA  
GBE Switch

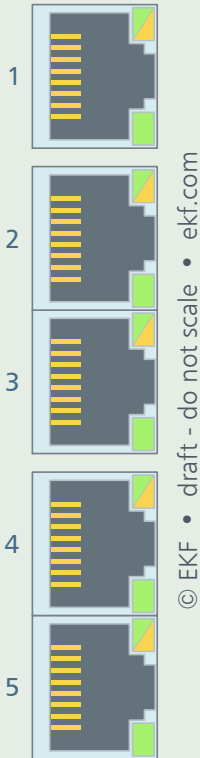
### Front Panel



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SL4-TUBA  
GbE Switch

Front Panel RJ45 Jacks 1-5

Gigabit Ethernet			
270.01.08.5 Single RJ45 Jack		270.02.08.5 2 x Dual RJ45 Jacks	
 <p>Upper LEDs: yellow=1Gbit/s green=100Mbit/s off=10Mbit/s</p> <p>Lower green LEDs on=link established blinking=activity (data)</p>	RJ45 F/P Jacks 1-5	1	MDX0+
		2	MDX0-
		3	MDX1+
		4	MDX2+
		5	MDX2-
		6	MDX1-
		7	MDX3+
		8	MDX3-



## Backplane Connector P1

P1 CompactPCI® Serial Peripheral Slot Backplane Connector												
EKF Part #250.3.1206.20.02 • 72 pos. 12x6, 14mm Width												
P1	A	B	C	D	E	F	G	H	I	J	K	L
6	GND	<i>PE TX 02+</i>	<i>PE TX 02-</i>	GND	<i>PE RX 02+</i>	<i>PE RX 02-</i>	GND	<i>PE TX 03+</i>	<i>PE TX 03-</i>	GND	<i>PE RX03 +</i>	<i>PE RX03- -</i>
5	<i>PE TX 00+</i>	<i>PE TX 00-</i>	GND	<i>PE RX 00+</i>	<i>PE RX 00-</i>	GND	<i>PE TX 01+</i>	<i>PE TX 01-</i>	GND	<i>PE RX 01+</i>	<i>PE RX 01-</i>	GND
4	GND	<i>USB2 +</i>	<i>USB2 -</i>	GND	<i>PE CLK+</i>	<i>PE CLK-</i>	GND	<i>SATA TX+</i>	<i>SATA TX-</i>	GND	<i>SATA RX+</i>	<i>SATA RX-</i>
3	<i>USB3 TX+</i>	<i>USB3 TX-</i>	GA0	<i>USB3 RX+</i>	<i>USB3 RX-</i>	GA1	<i>SATA SDI</i>	<i>SATA SDO</i>	GA2	<i>SATA SCL</i>	<i>SATA SL</i>	GA3
2	GND	I2C SCL	I2C SDA	GND	<i>RSV</i>	<i>RSV</i>	GND	RST#	WAKE #	GND	PE EN#	<i>SYS EN#</i>
1	+12V	<i>STBY</i>	GND	+12V	+12V	GND	+12V	+12V	GND	+12V	+12V	GND

pin positions printed white/italic: not connected

## Backplane Connector P5

## P5 CompactPCI® Serial Peripheral Slot Backplane Connector

EKF Part #250.3.1206.20.00 • 72 pos. 12x6, 12mm Width

P5	A	B	C	D	E	F	G	H	I	J	K	L
6	GND	16 ETH A+	16 ETH A-	GND	16 ETH B+	16 ETH B-	GND	16 ETH C+	16 ETH C-	GND	16 ETH D+	16 ETH D-
5	15 ETH A+	15 ETH A-	GND	15 ETH B+	15 ETH B-	GND	15 ETH C+	15 ETH C-	GND	15 ETH D+	15 ETH D-	GND
4	GND	14 ETH A+	14 ETH A-	GND	14 ETH B+	14 ETH B-	GND	14 ETH C+	14 ETH C-	GND	14 ETH D+	14 ETH D-
3	13 ETH A+	13 ETH A-	GND	13 ETH B+	13 ETH B-	GND	13 ETH C+	13 ETH C-	GND	13 ETH D+	13 ETH D-	GND
2	GND	12 ETH A+	12 ETH A-	GND	12 ETH B+	12 ETH B-	GND	12 ETH C+	12 ETH C-	GND	12 ETH D+	12 ETH D-
1	11 ETH A+	11 ETH A-	GND	11 ETH B+	11 ETH B-	GND	11 ETH C+	11 ETH C-	GND	11 ETH D+	11 ETH D-	GND

P5	
P5 Assignment ETH	Switch.Port
16	2.1
15	2.0
14	1.4
13	1.3
12	1.2
11	1.1

## Backplane Connector P6

## P6 CompactPCI® Serial Peripheral Slot Backplane Connector

EKF Part #250.3.1208.20.02 • 96 pos. 12x8, 18mm width

P6	A	B	C	D	E	F	G	H	I	J	K	L
8	GND	8 ETH A+	8 ETH A-	GND	8 ETH B+	8 ETH B-	GND	8 ETH C+	8 ETH C-	GND	8 ETH D+	8 ETH D-
7	7 ETH A+	7 ETH A-	GND	7 ETH B+	7 ETH B-	GND	7 ETH C+	7 ETH C-	GND	7 ETH D+	7 ETH D-	GND
6	GND	6 ETH A+	6 ETH A-	GND	6 ETH B+	6 ETH B-	GND	6 ETH C+	6 ETH C-	GND	6 ETH D+	6 ETH D-
5	5 ETH A+	5 ETH A-	GND	5 ETH B+	5 ETH B-	GND	5 ETH C+	5 ETH C-	GND	5 ETH D+	5 ETH D-	GND
4	GND	4 ETH A+	4 ETH A-	GND	4 ETH B+	4 ETH B-	GND	4 ETH C+	4 ETH C-	GND	4 ETH D+	4 ETH D-
3	3 ETH A+	3 ETH A-	GND	3 ETH B+	3 ETH B-	GND	3 ETH C+	3 ETH C-	GND	3 ETH D+	3 ETH D-	GND
2	GND	2 ETH A+	2 ETH A-	GND	2 ETH B+	2 ETH B-	GND	2 ETH C+	2 ETH C-	GND	2 ETH D+	2 ETH D-
1	1 ETH A+	1 ETH A-	GND	1 ETH B+	1 ETH B-	GND	1 ETH C+	1 ETH C-	GND	1 ETH D+	1 ETH D-	GND

P6	
P6 Assignment ETH	Switch.Port
8	3.4
7	3.3
6	3.2
5	3.1
4	3.0
3	2.4
2	2.3
1	2.2

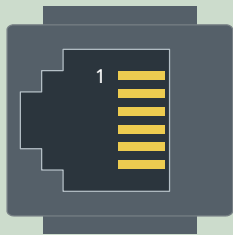


SL4-0900-TUBA



## Switch Management (Option)

The SL4-TUBA may be optionally provided with an RJ-11 jack for attachment of the Marvell® USB-2-SMI adapter module. The Windows® based Marvell® SOHO-GUI is an engineering (diagnostic) tool for experienced users which allows access to the GbE switch internal registers and tables. The USB-2-SMI is connected to the SL4-TUBA by means of a four lead cable (only pins 2 - 5 from the table below in use). The USB-2-SMI adapter module must be ordered directly from Marvell®. Signing of a Marvell® non-disclosure agreement (NDA) may be required. Please contact your nearest Marvell® sales office or distributor in your area, which can be located at <http://extranet.marvell.com/sales/>.

Option Serial Management Interface • 270.10.06.00 • RJ-11 Modular Jack		
 <p>270.10.06.00 © EKF • ekf.com</p>	1	NC
	2	SMI DATA
	3	GND
	4	GND
	5	SMI CLOCK
	6	NC

The SL4-TUBA can be configured also for remote in-band management across the front panel GbE jacks 4/5. This is not enabled by default in order to prevent from external attacks. Please contact [sales@ekf.com](mailto:sales@ekf.com) for in-band diagnostic availability before ordering.

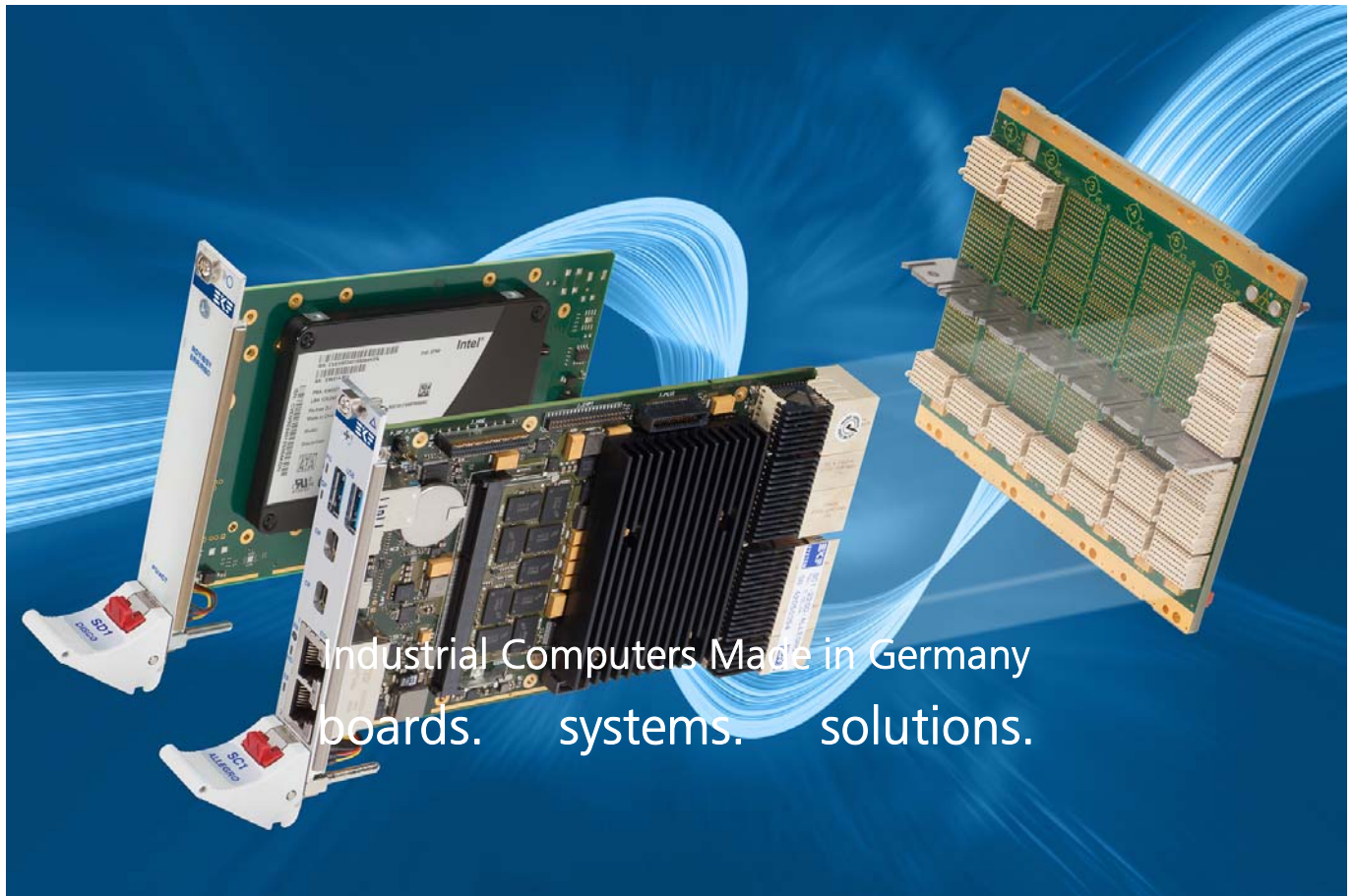
SL4-TUBA Links	
SL4-TUBA Home	<a href="http://www.ekf.com/s/sl4/sl4.html">www.ekf.com/s/sl4/sl4.html</a>
Intel® I210 Driver Download	<a href="http://www.ekf.com/s/sl4/sl4.html">www.ekf.com/s/sl4/sl4.html</a>
CompactPCI® Serial Technology Overview	<a href="http://www.ekf.com/s/smart_solution.pdf">www.ekf.com/s/smart_solution.pdf</a>

## Ordering Information

For popular SL4-TUBA SKUs please refer to  
[www.ekf.com/liste/liste\\_21.html#SL4](http://www.ekf.com/liste/liste_21.html#SL4)



SL4-TUBA in a Small Industrial System



Industrial Computers Made in Germany  
boards. systems. solutions.

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Philipp-Reis-Str. 4 (Haus 1)  
Lilienthalstr. 2 (Haus 2)  
59065 HAMM  
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